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Mechanisms of immunization of broadband radio stations for targeted interference

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Abstract: The rapid development of sophisticated military command and control systems causes the dynamic demand for broadband services

including the transmission of video in real time by using telecommunications links. One way to resolve the problem of limited bandwidth in used military wireless systems is to use modern broadband radio stations. Broadband radio stations in addition to undoubted advantages such as increased system bandwidth, have also some limitations – in comparison to narrowband radios, broadband radios offer a smaller range and work in a wide band and high transmitter activity associated with the generation of maintenance traffic, which makes it easier to detect radio emission by the opponent. Modern electronic warfare systems can track down such systems and overpower them. That is why one of the main tasks, which currently are facing designers of advanced broadband radio communication systems, is to develop mechanisms to immunize broadband radio stations on the targeted interference. In this article the method of implementation of the national waveform allowing for securing the transmission in broadband radio stations will be presented. Transmission modes of the radio station (TDMA, CSMA/SC, CSMA/MC) will be discussed considering advantages and disadvantages of each of the above-mentioned modes of operation. In the next chapter selected results of experimental studies of broadband radio station R-450C with the above-mentioned implemented operating modes and universal defeat device for generation of diverse broadband interference will be presented. The obtained results will allow to assess the implemented modes of radio stations for resistances of broadband radio communication system on selected targeted interference. The developed analysis and obtained measurement results may be helpful both for people organizing radio communication using broadband radios as well as for those responsible for the proper operation of electronic warfare systems.

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